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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/612,009	07/03/2003	Rieko Fukushima	7906.0018	5452

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EXAMINER

HAJNIK, DANIEL F

ART UNIT	PAPER NUMBER
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2671

DATE MAILED: 07/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/612,009	<b>Applicant(s)</b> FUKUSHIMA ET AL.	
	<b>Examiner</b> Daniel F. Hajnik	<b>Art Unit</b> 2671	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 02 October 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) 11-15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Claims 11-15 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected light direction detection device, there being no allowable generic or linking claim. Election was made **without** traverse in a telephone call with Richard Burgujian on 7/12/2005.

### ***Priority***

2. Acknowledgment is made of applicant's claim for foreign priority based on applications filed in Japan on 07/05/2002 and 07/01/2003. It is noted, however, that applicant has not filed a certified copy of the Japanese applications 2002-196859 and 2003-189226 as required by 35 U.S.C. 119(b).

### ***Specification***

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: "Three dimensional image display method and device utilizing light directional detectors for shading virtual objects".

4. The disclosure is objected to because of the following informalities: Page 13, line 21 of the submitted specification contains missing text which is marked by "###".

Appropriate correction is required.

***Claim Objections***

5. Claim 4 is objected to because of the following informalities: the term "the plurality of light sources" lacks antecedent basis. Appropriate correction is required.
6. Claims 7 and 8 are objected to because of the following informalities: Please change "a display surface configure" to "a display surface configured". Appropriate correction is required.
7. Claim 10 objected to because of the following informalities: Please add a period to the end of the claim. Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1, 3, and 5 are rejected under 35 U.S.C. 102(e) as being anticipated by Miyamoto et al. (US Patent 6290604, herein referred to as "Miyamoto").

As per claim 1, Miyamoto teaches the claimed "detecting a position of a light source" in figure 12, step S708, where the direction of one or more lights is detected (also see figure 16).

Miyamoto teaches the claimed "comparing the position of the light source and a virtual position of a display object in a three-dimensional image" in figure 14, where the light can be any of three light sources shown and the virtual object is the human figure in the middle of the figure (also see figure 16).

Miyamoto teaches the claimed "shading in the three-dimensional image" in figure 14 where there is a plurality of shadows (shading) drawn in response to the light sources.

As per claim 3, the rationale and reasons for rejection of claim 1 is incorporated herein. Miyamoto teaches the claimed "detecting positions of a plurality of light sources" in figure 14 where three separate light sources are shown.

Miyamoto teaches the claimed "comparing each of the positions of the light sources and a virtual position of a display object in a three-dimensional image to obtain relative positional relations" in figure 14, where each of the light sources is factoring into the shadows generated and also in figure 12, step S708, labeled 'Detect Direction of Ln-th Point Light'.

As per claim 5, the claimed device contains limitations that perform similar functions as the method claimed in claim 1, and thus are subject to the same reasons for rejection.

***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyamoto et al. (US Patent 6290604, herein referred to as "Miyamoto").

As per claim 6, the claimed limitations closely follow those of claim 5 except that the device uses a plurality of detectors instead of one detector, therefore only differences will be addressed. Miyamoto teaches the claimed plurality of detectors. In figure 20, which shows two shadows S1 and S2 generated from the light sources of the L1 (the light on the wall), and L2 (not shown, sunlight coming from behind the human figure), respectively. Given that two shadows are generated from largely different directions of light, it would have been obvious to one of ordinary skill in the art to use more than one light detector to generate shadows S1 and S2.

12. Claims 2, and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyamoto et al. (US Patent 6290604, herein referred to as "Miyamoto") in view of Foley ("Computer Graphics: Principles and Practice", 1996, herein referred to as "Foley").

As per claim 2, Miyamoto does not teach the claimed "detecting lightness of the light source". Foley teaches this limitation on page 734, equation 16.20 where the  $I$  sub  $\lambda$  values represent the intensity (lightness) of each light source. Using the Foley

equation (16.20) would require that the system also detect the lightness value of each light source.

It would have been obvious to one of ordinary skill in the art to combine Miyamoto with Foley. Miyamoto in figure 14 shows a shadow generation product requiring calculation using multiple light sources. The system of Miyamoto would benefit from detecting the intensity (lightness) value of these light sources and would benefit from using equation 16.20 as taught by Foley as well to produce more realistic shadows.

As per claim 4, Miyamoto does not teach the claimed "obtaining a position of a single virtual light source, which represents the plurality of light sources". Foley teaches these limitations on page 734, equation 16.20 and states "If there are  $m$  light sources, then the terms for each light source are summed" (first sentence under section 16.1.6, pg. 734). The process of summing each light source produces the end result of a virtual light source at a position representing the light coming each individual light source.

13. Claims 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyamoto et al. (US Patent 6290604, herein referred to as "Miyamoto") in view of Benton (US Patent 6917370).

As per claims 7-9, Miyamoto teaches the claimed "display surface configure to display the three-dimensional image" in figure 1, piece 30.

Miyamoto does not teach the claimed "detector is disposed on at least one of the display surface and a surface adjacent to the display surface" and "detector is disposed

to be adjacent to the display surface". Benton teaches these claim limitations in figure 5, piece 520 which shows a portable camera (detector) and a display piece 590. It would have been obvious to one of ordinary skill in the art to disposed the detector adjacent to the display in order to achieve a natural view and perspective for the operator of what lies in their visual site path (i.e. using the detector to display the overlaid graphics in figure 4 for navigation).

Miyamoto does not teach the claimed "detector is disposed at a position where the detector which detects the light source from the light in the same direction as at least one of a display direction of the three dimensional image and a direction in which the three-dimensional image is observed". The user of the system of Benton can be sailing in a direction (see figure 4) where the sun (light source) is in the same direction as onboard camera (figure 5, piece 520) for overlaying graphics where the detector (camera) detects light in the same direction as the 3D image is observed (graphic image in front on boat as seen in figure 4, also see col 5, lines 48-50). It would have been obvious to one of ordinary skill in the art at the time of invention to combine Miyamoto and Benton. Benton teaches the advantage of such a system by stating "The apparatus comprises a model engine adapted to display a representation of a computerized environment model, or a portion thereof, from a plurality of user selected viewpoints. The model may contain any type of data, for example rendered graphics" (col 3, lines 6-10). The system of Miyamoto would benefit from a plurality of selected user selected viewpoints based upon detectors (cameras) for navigation through a computer



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environment model in order to enhance a user experience such as the one shown in figure 20 of Miyamoto to be more realistic and interesting.

As per claim 10, Miyamoto does not teach the claimed "detector includes three-primary-colors detection means for adding colors to the shade". Benton teaches this limitation in figure 5, piece 520, which shows a camera (detector). It would have been obvious to one of ordinary skill in the art at the time of invention to use a camera to detect primary colors.

### ***Conclusion***

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Please see form 892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel F. Hajnik whose telephone number is (571) 272-7642. The examiner can normally be reached on Mon-Fri (8:30A-5:00P).


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka J. Chauhan can be reached on (571) 272-7782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



DFH 6/20/2005



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